unpaid), and Messrs. Langley and Lea, and University recognition of their work was asked for. Elementary Biology and Physiology of the Senses were also mentioned as needing a special lecturer.

With regard to Botany, teaching in Vegetable Morphology and in Physiology is urgently required, with lecture rooms and laboratories.

It is further asked that University teachers be eventually appointed in Agriculture, Anthropology, Geography, Metallurgy, and Mining.

In Geology it is pointed out that since Prof. Bonney left Cambridge, no College has given any assistance towards geological teaching, and that Dr. Roberts and the other demonstrators have received no University or College payments for the continued work they have done in lecturing and demonstrating.

The average number of students at present in the various departments of Biology and Geology is—Botany, 80; Geology, 40; Zoology, 75; Physiology, 120; Human Anatomy, 100 each term.

Donald MacAlister, M.D., M.B., Fellow and Medical Lecturer of St. John's College, Cambridge, was on Thursday, June 14, elected a member of the Council of the College.

The following awards have been made at St. John's College for proficiency in Natural Science:—Foundation Scholarships to Andrews, Kerr, Phillips (R.W.); Exhibitions to Goodman (already Scholar), Cooke, (E. H.), Fenton, Jones (H. R.), Watts; a Proper Sizarship to Gepp. Goodman obtains a Wright's Prize with augmentation of emoluments to 100*l.*, and a Hughes' Prize, as one of the two most distinguished third-year students in the College. The Open Exhibition was awarded to Rogers.

MR. J. V. JONES, Principal of Firth College, Sheffield, has been elected by the Council to be the first Principal of the University College for South Wales and Monmouthshire.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 24.—"The Effects of Temperature on the Electromotive Force and Resistance of Batteries, II." By William Henry Preece, F.R.S.

In the discussion on the previous paper read on February 22, 1883, it was suggested that observations should be made on the influence of temperature to the case of secondary batteries. One of Mr. Tribe's cells was used.

The negative element of this cell consisted of pure peroxide of lead in the form of a plate 4 inches square carried in a grooved frame, from one end of which projected the necessary conductor. This element was placed between two plates of finely divided lead likewise 4 inches square. These were joined together, and formed the positive element of the cell. Each half of the positive plate was about a quarter of an inch distant from the negative, and all three plates were incased in a thin specially prepared fabric. The elements were contained in a leaden case, and the liquid was sulphuric acid of the strengths given in the various experiments. This cell was placed inside the cylindrical copper vessel used in the previous experiments, and precisely the same method of observation was adopted. The influence of heat on secondary cells was the same in kind as in the Daniell cell, but it differs very much in degree. The electromotive force practically remains constant for all degrees of temperature, but the internal resistance diminishes as the temperature increases at a very steady rate, increasing again as the temperature is lowered. The effect of varying the percentage of acid in solution is not very marked, though as might have been anticipated from Kohlrausch's observations, the 30 per cent. proportion gives the lowest resistance. The mean average reduction in resistance between 0° and 100° C., is 59·6 per cent.

Chemical Society, June 7.—Dr. Perkin, president, in the chair.—The following papers were read:—Laboratory notes by J. H. Gladstone and A. Tribe: (1) On the action of light and heat on cane and invert sugars; cane sugar solution, when heated, forms a small quantity of a substance which is not alcohol, but which gives the iodoform reaction. (2) On hydroxylamine; the copper zinc couple reduces this substance, ammonia being formed. (3) On the recovery of iodine from organic iodide residues; the residues are poured on to an excess of the couple, and the iodide of zinc formed, extracted with hot water; iodine is obtained in the free state by the action of hydrochloric acid and bleaching powder on the iodide. (4) A residual phenomenon of the electrolysis of oil of vitriol; the formation of Berthelot's persulphuric acid was noted. (5) On an alleged test for alcohol; Davy suggests that alcohol can be detected by the blue colour produced with a warm solution of molybdic anhydrid in oil of vitriol. The authors find that other reducing substances and sugar give the same reaction. (6) Reaction of the couple on nitric oxide; ammonia is formed, but no protoxide. (7) On the reducing action of spongy lead.—Note on a basic ammonio-copper sulphate, by S. U. Pickering.—Notes on Loew and Bokorny's researches on the probable aldehydic nature of albumin, by A. B. Griffiths.—Note on the action of sulphuric acid, sp. gr. 1·84, upon potassium iodide, by H. Jackson. The author has investigated this reaction quantitatively; he finds that two reactions occur, one with an excess of sulphuric acid when iodine and sulphur dioxide are formed; the second when just sufficient sulphuric acid is used to satisfy the potassium iodide; iodine and sulphuretted hydrogen are then liberated.—The action of nitrous anhydride on glycerin, by O. Masson. The author obtained the trinitrite of glyceryl; it is an amber-coloured liquid boiling at 150°, burns with a white flame, but does not explode under the hammer. It is decomposed by water, and cannot be preserved. In sealed tubes it generates sufficient gas to shatter the glass.

Linnean Society, June 7.—Sir John Lubbock, Bart., president, in the chair.—Mr. R. J. Clarke and Mr. Frank Matthews were elected Fellows of the Society.—Mr. W. T. Thiselton Dyer exhibited a series of Copals: some from Inhambane, near Mozambique, the product of *Copaifera Gorskiana* of various sorts, with a melting point from 310° to 360° Fahr.; others from Lagos (obtained by Capt. Moloney), used by the natives for burning, and powdered by the women as a body perfume. These last are supposed to be from a species of *Daniellia*, the native name being "Ogea."—Mr. Hiern drew attention to specimens of *Quercus Ilex*, var. *Fordii*, from Barnstaple, Devon, showing remarkable alteration in the leaves after pruning. There was exhibited for Mr. Stansfield R. Rake a burdock leaf with numerous excrescences, supposed to be the result of insect irritation.—Mr. G. Murray exhibited specimens of dace killed by the fungus disease (*Saprolegnia ferax*), the result of inoculation, and said to be the first recorded experimental proof of the communicability of the disease to those fish.—Dr. Cobbold showed shrimps sent by Dr. Burge of Shanghai. They contained immature flukes, which it was thought might prove to be the larval state of one or other of the three species of human fluke known to infest man in eastern countries. He proposed to call the parasite *Cercaria Burgei*.—A paper was read by Mr. H. N. Ridley, on new and rare monocotyledonous plants from Madagascar, among which may be mentioned species of *Drimia* hitherto only known from Africa, several curious orchids, one remarkable for possessing only one or two very large, handsome green, white, and purple flowers. Of Cyperaceæ one form well known as an Indian plant, another of the genus *Fintelmannia*, supposed to be confined to Brazil; he also describes a new genus, *Acriulus*, allied in some respects to *Cryptangium*.—A communication was read from Mr. George Lewis, on Japan Brenthidæ and notes of their habits. These beetles form part of the collection made by the author in his visit to Japan during the summers of 1880-81. He observes that there is no geographical barrier sufficient to exclude tropical forms from Japan, but their environment, when they reach it, prevents them from establishing themselves, to any great extent at least, in the northern parts. In the southern islands of the Japanese Archipelago the warmer climate enables a fair number of beetles of a truly tropical type to exist. The fact that each genus is only represented by one species nevertheless points to some physical check in their spread and numbers. A new genus, *Higonius*, is characterised, and several species of this and other genera described and illustrated.—Mr. T. H. Corry read a paper on the fertilisation of the Asclepiads, chiefly bearing out views noticed on a former occasion.—A short record of observations on the White Ants (Termites) of Rangoon, by Dr. Robert Romanis, was read by the Secretary. He details what he saw in what may be termed the swarming of a nest.

EDINBURGH

Royal Society, June 4.—Mr. Thomas Gray, vice-president, in the chair.—Mr. Buchan read a second paper on the oscilla-

tions of the barometer, the conclusions of which were based largely on the *Challenger* observations. It appeared that the greatest diurnal oscillation occurred in regions over the sea where the air was very moist, being least indeed in those oceanic regions north and south of the equator where the average height of the barometer was greatest; whereas over land the contrary was the case, the greatest oscillations occurring where the air was driest. The explanation given was that over the ocean, whose surface changes very slightly in temperature throughout a whole day, the main effect results from the direct heating of the air and its contained moisture; while over the land the effect due to surface changes preponderates, being less, of course, the better the air acts as a screen to the solar rays, that is, the moister it is. Mr. Buchan then proceeded to account for the double maximum in the diurnal oscillations of the barometer. Beginning at six o'clock in the morning, an hour at which in general the barometer shows its daily mean, we find that the first effect of the sun is to heat the air, which tends to expand and rise. This tendency is of course somewhat resisted, so that the pressure is in the first instance increased; but by and by this resistance is overcome, the air flows freely upwards, the morning maximum is reached, and the pressure begins to fall. After noon this diminution in pressure is accelerated by the cooling of the air, for the same reason that the first effect of heating is to increase the pressure. Hence the barometer falls to its afternoon minimum. But as this is going on the region to the west is in its turn being heated, and an eastward movement of air overhead takes place towards the first locality, arresting the diminution of pressure, and then bringing it to a second maximum. This action, however, ceases as midnight comes on, the cooling of the air being then left to have its own effect, and the pressure falling to its second minimum till the approach of the sun on the east makes itself felt, and the same cycle of operations begins again. The modifications introduced by special conditions, such as the distribution of land and water, were also discussed, and explanations given of the retardation in certain places of the maxima and minima in time, and of the very slight, almost imperceptible, second minimum which in such cases frequently is found.—In presenting the last report of the Boulder Committee, Mr. Milne Home, the convener, intimated that the Committee purposed giving a general report in a form in which it could be readily compared with the British Association reports.—Mr. W. E. Hoyle read a paper on a new Entozoon from the mesentery of *Proteles cristatus* (Spairman). It is closely allied to *Pentastomum Diesingii* described by Van Beneden, belonging indeed to the same genus, but distinguished by its size, the number of its segments, and a slight difference in shape. The most curious point in its anatomy is that when the animal is encysted in the mesentery of its host the cirrus-sac is empty, and there is a stoppage in the vas deferens. The name proposed for the parasite is *P. Protelis*.

Mathematical Society, June 8.—Mr. J. S. Mackay, F.R.S.E., president, in the chair.—Mr. Thomas Muir, F.R.S.E., communicated some mathematical notes of interest to teachers and a new proof of Prof. Tait's problem of arrangement.—Mr. A. Y. Fraser read a paper on the fundamental notions of the differential calculus; and Dr. C. G. Knott, F.R.S.E., discussed the singularities of plane curves.

Berlin

Physiological Society, May 11.—Prof. Brieger reported on the further results of his study of the violent poisons formed by decomposition of animal bodies. In continuation of the communication he made a short time ago to the Society he described the process by which he had obtained from decomposing masses of flesh a substance which crystallised in acicular forms, and which he obtained by repeated crystallisation in such a degree of purity that he was able to analyse it. It afforded the empirical composition $C_5H_{14}N_2H_2Cl_2$, and consequently was a hydrochloric salt of a new base, which did not in its constitution resemble any known combination. This diamin-base had no longer the toxic properties of the extracts of the decomposition products. It was extremely easily decomposed, and could only be prepared from decomposing meat, and could neither be obtained in the later stages of putrescence nor from decomposing fibrin or other albuminous substances. Neither could it be demonstrated to be a constituent of meat. A second substance was obtained from the mother-liquor that remained after the crystallisation of the diamin-salt. This body, after purification by recrystallisation, showed the composition of $C_5H_{11}NCl$. This base proved to be a very virulent poison; 1 mg. in solution injected subcutaneously into a rabbit very soon produced the set of symptoms characteristic of fish-poison, *i.e.* salivation, quickened respiration, and diarrhœa, followed in a short time by death in convulsions. Even after the isolation of these exceedingly poisonous bases the mother-liquor contained other bases which have as yet not been more closely studied, and which belong to the group denominated by Prof. Brieger, "peptotoxine." They are more or less poisonous in their action upon the living organism, are decomposed with extraordinary facility, and are not only formed in the first stages of decomposition of masses of flesh, but are also contained in neurin in peptones.—Dr. George Hoppe-Seyler, who was present as a visitor, reported the results of the experiments that he made, starting on the basis of the chemical relation of nitrophenylpropiolic acid to indigo, which was studied by Herr Baeyer, in order to determine the physiological action of this acid, hoping thus to advance a step in the comprehension of the formation of indol and oxindol in the living organism. He found that oxindol appeared in the urine of rabbits into whose stomachs he had introduced solutions of nitrophenolpropiolate of soda, the animal in the meantime evincing no morbid symptom. When the solution was subcutaneously injected, blood appeared in the urine along with the oxindol, and when the treatment was continued for some time the constitution of the rabbits was injuriously affected so that they finally died, without, however, manifesting any characteristic symptoms. Dogs behaved quite otherwise when even a third part of that which the rabbits bore without inconvenience was introduced into their stomachs, increasing quantities of albumen and sugar appeared in their urine, and the animals succumbed to emaciation and loss of power. This very remarkable difference in the action of nitrophenylpropiolic acid on dogs and rabbits was not conditioned by the different diet, because when rabbits were driven to take to albuminous diet, by inanition or milk diet, until the reaction of the urine was acid, or when, on the other hand, the urine in dogs was made alkaline by giving them acetate of soda, the differences of the action remained unaltered, and their study promises a key to the comprehension of the origin of albuminuria and glycosuria.

CONTENTS